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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/671,894	09/26/2003	Herbert Bruder	P03,0333	7996

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SCHIFF HARDIN & WAITE

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6600 Sears Tower
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EXAMINER

ARTMAN, THOMAS R

ART UNIT	PAPER NUMBER
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2882

DATE MAILED: 10/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/671,894

Applicant(s)

BRUDER ET AL.

Examiner

Thomas R Artman

Art Unit

2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-9 is/are rejected.
- 7) ☒ Claim(s) 4 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>09 February 2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

Claim 1 is objected to because of the following informalities: for grammatical correctness, it appears as though the term “the” in line 7 should be deleted. Appropriate correction is required.

Claim 7 is objected to because of the following informalities: it appears as though the term “tomogram” in line 11 should be spelled “topogram”. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 5 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Hu (US 5,784,481).

Regarding claim 1, Hu discloses a method for generating an image (Figs.1 and 3), including:

a) providing a CT x-ray device having:

Art Unit: 2882

- i) a multi-row x-ray detector array 16,
 - ii) an x-ray radiator 12 rotatable around a system axis Z that emits a conical beam (col.2, lines 58-59),
 - iii) a positioning device 48 adapted to receive an examination subject 44 for positioning the subject in a direction parallel to the system axis Z;
- b) generating raw data by radiating the examination subject with the x-ray beam in a rotational scan to acquire a plurality of projections during at least one revolution or partial revolution of the x-ray radiator around the subject (col.3, lines 9-21), and by a linear scan where transmission values are acquired at different positions of the subject parallel to the system axis Z, without rotation of the x-ray radiator, with all of the values generated by the linear scan being acquired in a continuous linear scanning movement (col.3, line 48, to col.4, line 18), and
- c) generating an image of the subject from the raw data generated by the rotation scan and the linear scan (col.3, lines 39-63).

With respect to claim 2, the transmission values of the continuous linear scanning movement are acquired in direct succession (col.3, lines 48-51).

With respect to claim 3, all projections of the rotational scan are acquired in one continuous rotational movement of the x-ray radiator (col.3, lines 12-17).

With respect to claim 5, the plurality of projections of the rotational scan are acquired at a single position of the subject in the direction parallel to the system axis Z during at least one

Art Unit: 2882

revolution of the x-ray radiator around the subject, employing a flat detector (planar detector 16, also see item 52 of Fig.4).

With respect to claim 6, the linear scan is conducted as a topogram of the subject.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hu in view of Adler (US 6,028,907).

Regarding claim 7, Hu discloses a method for generating an image (Figs.1 and 3), including:

- a) providing a CT x-ray device having:
 - i) a multi-row x-ray detector array 16,
 - ii) an x-ray radiator 12 rotatable around a system axis Z that emits a conical beam (col.2, lines 58-59),
 - iii) a positioning device 48 adapted to receive an examination subject 44 for positioning the subject in a direction parallel to the system axis Z;

Art Unit: 2882

b) acquiring a linear scan of the subject by measuring transmission values of the subject at different positions of the subject along a direction parallel to the system axis Z, without rotation of the x-ray radiator (col.3, line 48, to col.4, line 18),

c) obtaining raw data of the examination subject in a rotation scan by acquiring a plurality of projections of the subject during at least one revolution of the x-ray radiator around the subject (col.3, lines 9-21), and

d) reconstructing an image of the subject from the acquired linear scan transmission values in combination with the raw data acquired during the rotation scan.

Hu does not disclose the use of the linear scan as a topogram, where the topogram is displayed for selecting a relevant region of the subject in the topogram and then storing the topogram.

Adler teaches an image reconstruction method that requires using linear scan image data, referred to as "scout data", which is an art-recognized synonym of a topogram, with the CT scan data in order to complete a 3D reconstructed image (Fig.2, and col.6, lines 1-9). Adler recognizes the convenience having the dual purpose of the scout data since linear scan data is needed for the reconstruction algorithm (col.6, items (3) and (4)). The scout scan is performed regardless of the reconstruction algorithm because the regions of interest and other operating parameters of the CT system need to be defined, and the corresponding data sets for each slice of the scout data and CT data are easily retrieved when both are taken in the same reference frame. This is true of Hu's invention, where the same origin (and hence, the coordinate system and reference frame) is used throughout the method (col.3, lines 17-21).

Art Unit: 2882

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the device of Hu to perform the linear scan as a topogram, where the topogram is displayed for purposes of selecting a relevant region of the subject and storing the topogram until it is needed in the reconstruction algorithm, such that the process is more efficient, as taught by Adler.

With respect to claim 8, Hu executes the rotation scan to cover at least a relevant region.

With respect to claim 9, Hu acquires all of the projections of the rotational scan in one continuous rotational movement of the x-ray radiator (col.3, lines 9-21).

Allowable Subject Matter

Claim 4 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the prior art of record neither teaches nor reasonably suggests the additional limitation of, during the rotational scan, acquiring a plurality of projections at each subject position along the Z axis with at least one revolution of the x-ray radiator around the subject, as required by the combination of claim 4.

Art Unit: 2882

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


Hu (US 6,014,419) teaches a conical beam reconstruction algorithm that requires a circular/helical composite path or a circular/linear composite path, or any composite path where the first remains within a plane perpendicular to the Z axis, and the second is not confined to the plane.

US patents to Adler (US 6,028,907 and US 5,946,370) teach the use of scout scan data with CT scan data in the image reconstruction method in CT devices.

Ning (US 6,504,892) teaches the practice of using scout data for estimating x-ray scatter data for use in correcting the image data.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas R Artman whose telephone number is (571) 272-2485. The examiner can normally be reached on 9am - 6:30pm Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.


EDWARD J. GLICK
SUPERVISORY PATENT EXAMINER

Art Unit: 2882

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Thomas R. Artman
Patent Examiner

